Vol. [illegible] No. 6 SEPTEMBER 22, 1945

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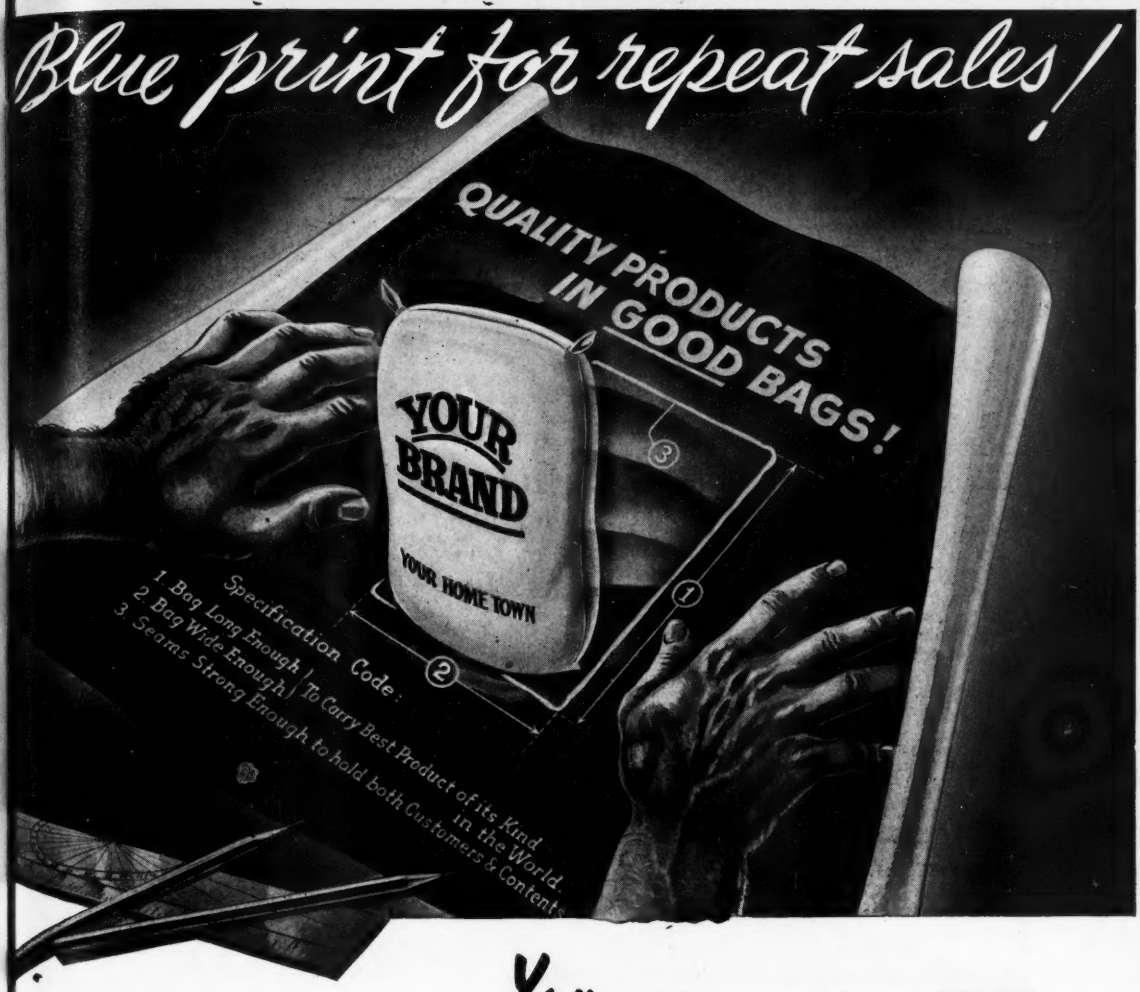
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See page 27

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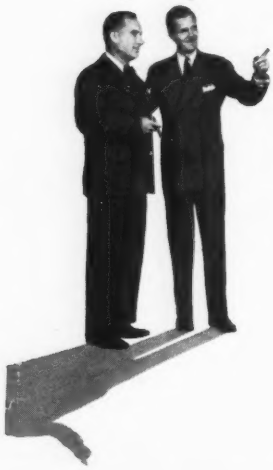

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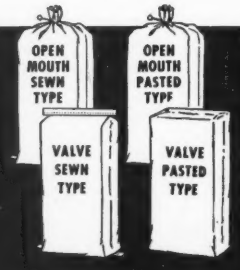

...THE...

AMERICAN FERTILIZER

"That man is a benefactor to his race who makes two blades of grass to grow where but one grew before."

Vol. 103 SEPTEMBER 22, 1945 No. 6

California Fertilizer Usage

By WELLER NOBLE

General Manager, Pacific Guano Co., Berkeley, Cal.

THE requirement of the War Food Administration for securing of applications from consumers for fertilizers showing acreage and kinds and quantities of fertilizers to be used, for the purpose of more equitably distributing fertilizers during the war era, offered such valuable information for statistical purposes that the Fertilizer Industry in California agreed to forward copies of these applications to the State Department of Agriculture so that they could be properly segregated and tabulated.

Statistical data compiled from applications for fertilizer for the year 1943 are interesting and enlightening. The data are segregated in six-month periods. The figures for the first six months of 1943 represent 99 per cent of the total fertilizers sold in California, but due to the delay in reports, the last six months' figures prepared represent but 48 per cent of the total tonnage. The data on usage are not materially altered, however, because of the fact that complete returns were not forwarded to the Department of Agriculture in sufficient time for inclusion in the 1944 report of the Department.

The complete data are published by the Department of Agriculture in Bulletin 208. If approximately double the acreage and tonnage is taken for the last six months of 1943, a fairly accurate picture is shown.

Use of Fertilizer January through June, 1943

The soils on which fertilizer was applied amounted to 1,036,316 acres. Usage is divided as follows:

	Acres	% of Total
Vegetables	415,588	40.1
Tree Crops, other than citrus	86,618	8.3
Citrus	152,095	14.7
Miscellaneous Crops	260,298	25.1
Grapes and Berries	36,876	3.5
Grain and Forage Crops	45,369	4.4
Ornamental and Condiment Crops	5,068	0.5
Crops not segregated	34,404	3.3

These figures are interesting, as they are the first ever published with any authenticity with respect to acreages fertilized in California. It is quite illuminating in outlining these data to break down the use of the plant food applied to the soils for various crops into actual percentages of nitrogen (N), phosphoric acid (P_2O_5), and potash (K_2O).

Figures shown are the percentage of each plant food used for various crops in relation to the total plant food units applied in this period.

The total tons of fertilizers applied amounts to 156,325 tons, or in terms of the three plant food elements amounted to:

	Tons	% of Total
Nitrogen (N)	20,736	58.3
Phosphoric Acid (P_2O_5)	10,081	28.4
Potash (K_2O)	4,712	13.3

From the above figures it will be noted that for the spring of 1943, 58.3 per cent of the plant food used in the production of California crops was nitrogen, and 41.7 per cent phosphoric acid and potash.

The application of these plant food elements on the various crops is shown by per-

centage and is calculated in relation to the total of each element used.

	Total Nitrogen	Total Phosphoric Acid	Total Potash
Vegetables	40.1%	51.4%	55.7%
Tree Crops, other than citrus	10.8%	5.2%	8.0%
Citrus	24.8%	15.8%	19.7%
Miscellaneous Crops	15.1%	20.7%	5.8%
Grapes and Berries	2.9%	4.2%	6.8%
Grain and Forage Crops	2.6%	0.9%	0.2%
Ornamental and Condiment Crops	0.6%	0.9%	2.3%
Crops not segregated	2.7%	0.8%	1.3%

The percentage of the total quantities of nitrogen, phosphoric acid and potash used on various crops indicates fertilizing practices which are of value to California farmers.

July through December of 1943

It is regretted that only 48 per cent of the records were available for statistical purposes for the fall months, but general fall fertilizer usage is indicated by these records. If the acreage and fertilizer tonnage is doubled, a fairly accurate figure will be shown. The figures shown below represent only the data shown on applications available when the Department of Agriculture published its report.

Such figures show that 428,643 acres were fertilized in California during the last six months of 1943, outlined as follows:

	Acres	% of Total
Vegetables	200,762	46.8
Tree Crops, other than citrus	51,207	11.9
Citrus	57,353	13.4
Miscellaneous Crops	80,264	18.7
Grapes and Berries	16,528	3.9
Grain and Forage Crops	7,162	1.7
Ornamental and Condiment Crops	1,655	0.4
Crops not segregated	13,712	3.2

The percentage of plant food used in the production of these crops in relation to the total quantity of each plant food calculated on the basis of the actual elements of nitrogen (N), phosphoric acid (P_2O_5), and potash (K_2O) is as follows:

	Total Nitrogen	Total Phosphoric Acid	Total Potash
Vegetables	51.3%	48.5%	45.8%
Tree Crops, other than Citrus	16.5%	11.5%	20.8%
Citrus	20.1%	12.1%	18.8%
Miscellaneous Crops	4.8%	21.6%	3.3%
Grapes and Berries	4.1%	4.1%	9.7%
Grain and Forage Crops	0.4%	1.1%	0.2%
Ornamental and Condiment Crops	0.4%	0.4%	0.5%
Crops not segregated	2.4%	0.7%	0.8%

The actual quantities of nitrogen (N), phosphoric acid (P_2O_5), and potash (K_2O), represented as having been used during the last half of 1943 is shown below. It must be borne in mind that about double this quantity was used:

	Tons	% of Total
Nitrogen (N)	8,765	52
Phosphoric Acid (P_2O_5)	5,762	34
Potash (K_2O)	2,369	14

Summary

About 1,893,602 acres were fertilized in California during 1943 and on these 301,450 tons of fertilizer were applied. The farm value of California crops that year amounted to $1,121,004,000, derived from approximately six million crop acres.

The wider distribution of fertilizers and increased yields resulting from their use will be an important factor in adding to the value of California products.

Nitrogen fertilizers are recognized as necessary for most California soils, but it is evident from the above figures that fertilization with phosphoric acid and potash is also desirable and important in farming programs in California.

Pasture Crops Require Liberal Fertilization

Dr. G. H. Ahlgren of Rutgers University, writing in the *New Jersey Farm and Garden*, says: "Good pasture crops efficiently managed are the most economical source of feed for livestock. Because good pasture crops can be as productive as silage corn or alfalfa or clover hay, it is necessary to supply similar quantities of fertilizer. Enough lime should be added to the soil before seeding to raise the *p*H to approximately 6.5. Adequate fertilizer is also needed and this usually means about 600 lbs. of a 5–10–10 or similar ratio fertilizer applied before seeding. Half of this amount ought to be plowed under and the rest applied on top of the seedbed with the grain drill to a depth of 3 or 4 inches. Top-dressing each year, in fall or spring, with 500 lbs. of a 5–10–5 per acre is adequate. If more than 50 per cent of the stand is legume, it would be best to use a fertilizer such as an 0–12–12 or 0–14–7. Annual top-dressings of 5 to 10 tons of phosphated manure per acre can take the place of the 500 lbs. of fertilizer mixture recommended for top-dressing.

Results of 1945 Fertilizer Demonstrations on Small Grain and Hay

By C. J. CHAPMAN
Soils Department, University of Wisconsin, Madison, Wis.

ACTUAL trials with fertilizers on farms throughout Wisconsin have given us positive proof that our soils are running low in their supplies of certain plant food elements. Soil tests for available phosphorus and potassium on over 300,000 samples have shown that, for the State as a whole, 77 per cent of our soils are deficient in available phosphorus and 57 per cent are deficient in available potassium.

The thousands of field demonstrations which have been conducted during the past thirteen years verify and back up the information gained from soil testing. In checking over the results of these demonstrations we find that on oats and barley the value of increases in yields of grain and straw was sufficient to pay the entire cost of the fertilizer in 85 per cent of all trials. Where comparisons were made of 20 per cent superphosphate and phosphate-potash mixtures, we find that the phosphate-potash mixtures gave the largest profit in 57 per cent of those trials. But when the residual effect of fertilizers applied at the time of seeding was checked on hay yields the following year and the value of the increases in yield of hay was added to the value of increases in grain and straw, we find that a profit has been shown in 95 per cent of all trials, with 70 per cent showing the largest net profit where the phosphate-potash combination was used. Tests conducted in northern Wisconsin in 1945 indicate that on the red clay soils phosphate fertilizer is badly needed. Those soils also respond to potash.

What Fertilizer to Use for Small Grain and Seedings

Based on the results of hundreds and thousands of demonstration trials conducted in the past thirteen years, we are recommending on most soils in Wisconsin that some potash in addition to phosphate be used for grain and legume seedings. For years we have known that most of the sandy soils in the State were low in available potash. We have accepted without question the need for potash on the low bottom muck, peat, black sandy, silt and clay soils. Now, however, we are finding that on a high percentage of the silt and clay loam upland soils potash is needed in addition to phosphate for maximum returns, especially where legumes are seeded with the nurse crop.

The effect of fertilizer used on the plots in northern Wisconsin in 1945 was especially noticeable on the clover seedings. In some cases the clover was a foot high in the grain on the fertilized plots at the time of harvest. Table I gives the average of all grain plots for all plots in 1945 where a direct comparison was made between 0–20–0, 0–20–10 or 0–20–20 with or without ammonium nitrate. A comparison of the average yields of all grain plots for the past thirteen years is also given.

For silt and clay loam soils in average fertility where applied with a fertilizer grain drill, we are recommending 0–20–10 or 0–14–7 fertilizer at rates up to 250 lbs. per acre, or 300 to 400 lbs. per acre where applied broadcast. For the sandier soils where seedings of clover or alfalfa are being made we recommend from 300 to 500 lbs. per acre of 0–20–20 or 0–14–14. For Vicland oats or other grain crops grown on soils where the straw is normally short, we are recommending some nitrogen in the fertilizer and such mixtures as 3–18–9, 4–12–8 or 3–12–12 are suggested, or apply ammonium nitrate or other nitrogen fertilizers as a top dressing at rates of from 50 to 100 lbs. per acre. Table I, giving average yields for the 1945 plots, shows the increases in grain yields due to treatment with nitrogen. For small grain on the bottom muck or peat soils we recommend 250 to 300 lbs. per acre of 0–9–27, 0–20–20 or 0–14–14.

There are soils where phosphate only is needed; soils, too, which are adequately supplied with plant food elements and on such soils no fertilizers are needed. We urge farmers to have their soils tested as a guide in determining the kind and amount of fertilizer to use. Most County Agents and many of the fertilizer companies are equipped to test soil samples or samples may be sent to the Soils Department at Madison for testing.

How to Apply Fertilizers

For best results, fertilizers should be applied with a combination fertilizer grain drill which sows grain, fertilizer, and grass seed all in one operation. However, broadcast applications of fertilizer can be made with the regular hopper type broadcast sower or with the end gate trailer type spreaders. Where the end gate or trailer type spreader is used, it is desirable to mix some limestone or soil with the fertilizer in order to bulk it up. Many farmers sow fertilizer by hand. Where the combination drill is used for the application of fertilizers with nitrogen and high potash content, especially on sandy soils, we caution against drilling more than 200 lbs. per acre in direct contact with the seed grain. For heavy applications on these sandy soils or silt and clay loams, it is best to drill the fertilizer at the desired rate first and then drill the grain in a separate operation in order to avoid possible germination injury to the seed.

Fits into General Soil Building Program

The application of from 200 to 500 lbs. per acre of commercial fertilizer at the time of seeding our fields to clover, alfalfa or other legumes and repeated every rotation will gradually build up the fertility of the farm as a whole. Larger yields of grain, bigger crops of alfalfa and clover will add to the home-grown feed supply and will thus cut feed costs and increase the possible livestock-carrying capacity of the farm. With prices for farm products at present high levels we can afford to apply fertilizer at heavier rates and thus secure a substantial profit from its use.

TABLE I

AVERAGE YIELDS FOR 8 PLOTS—1945—IN BAYFIELD, ASHLAND, IRON AND PRICE COUNTIES WHERE A COMPARISON WAS MADE OF 0–20–0 WITH 0–20–10 AND 0–20–20, WITH AND WITHOUT AMMONIUM NITRATE. (AMMONIUM NITRATE APPLIED AS A TOP DRESSING AT AVERAGE RATE OF 63 POUNDS PER ACRE AFTER SEEDING)

Treatment (Av. for All Plots)	Crop	Yield per Acre Grain	Yield per Acre Straw	Bushels Increase Grain	Pounds Increase Straw	Value of Increase Grain & Straw	Cost of Fertilizer	Net Profit per Acre
265 lb. of 0–20–0	Oats	49.6	1880	13.4	371	$ 9.64	$3.63	$ 6.01
265 lb. of 0–20–0 plus 63 lb. of Ammonium Nitrate	Oats	58.2	2361	22.0	852	16.43	5.36	11.07
265 lb. of the average of 0–20–10 and 0–20–20 plots	Oats	59.4	2314	23.2	805	17.09	6.02	11.07
265 lb. of 0–20–10 and 0–20–20 plots (average) plus 63 lb. of Ammonium Nitrate	Oats	67.2	2791	31.0	1282	23.35	7.75	15.60
No fertilizer	Oats	36.2	1509					

AVERAGE OF 550 GRAIN DEMONSTRATIONS (13 years, including 1945) WHERE THE YIELDS OF 0–20–0 AND 0–20–10 OR 0–20–20 ARE COMPARED

Soil Type	Treatment	Average Rate per Acre	Average Yield	Increase Yield	Average Yield Straw	Increase Straw	Value of Increase Grain & Straw*	Cost of Fertilizer	Net Profit per Acre
Mostly silt and clay loams	0–20–0	200	53.04	10.38	2537	443	$ 7.63	$2.65	$4.98
	0–20–10	200	57.16	14.50	2705	611	10.64	3.75	6.89
	Check		42.66		2094				

RESIDUAL CARRY-OVER BENEFIT TO HAY CROP (13 years, including 1945). SHOWING TOTAL VALUE OF HAY, GRAIN AND STRAW, AND PROFIT OVER COST OF FERTILIZER (138 plots)

Soil Type	Treatment	Rate per Acre	Average Yield Grain	Value of Increase Grain & Straw*	Average Yield of Hay	Pounds Increase Hay†	Value of Increase Grain, Straw and Hay	Cost of Fertilizer	Net Profit per Acre
Mostly silt and clay loams	0–20–0	200	52.3	$ 8.95	4749	1400	$19.45	$2.65	$16.80
	0–20–10	200	56.0	10.79	5434	2085	26.43	3.75	22.68
	Check		41.5		3349				

*Oats and barley figured at average value of 65c per bushel; straw at $4.00 per ton.
†Hay figured at $15.00 per ton.

August Tag Sales

Fertilizer consumption, as indicated by the sale of tax tags, continued its upward trend in August. Total sales in the 17 reporting States during the month represented 321,000 tons, exceeding August, 1944, by 22 per cent. Increases over last year were reported by 13 of the 17 States. The increases in July and August sales indicate the effectiveness of the early buying and shipping campaign fostered by the Government and the various States.

Sales in the January–August period exceeded sales in the corresponding period of 1944 by 10 per cent.

On the basis of tag sales, commercial distribution of fertilizers to American farmers in 1945 is at the rate of about 69 per cent more fertilizer than was so distributed on the average in the five years preceding the war, 1935–1939. This has been done in spite of the various wartime handicaps to production and the stoppage of imports of fertilizer materials from Europe, and the needs of agriculture for fertilizer have been taken care of at reasonable prices. Prices received by farmers for their products this year are 89 per cent above the 1935–1939 average, but prices paid for fertilizer are only 21 per cent above 1935–1939.

Barrett Opens Norfolk Sales Office

The Barrett Division, Allied Chemical & Dye Corporation, has transferred its sales office for the Norfolk district from Hopewell, Va., to 201 Granby Street, Norfolk, Va. The move has been made to better serve the fertilizer industry in North Carolina and most of Virginia and to facilitate the distribution of "Arcadian" nitrate of soda, in this territory. C. J. Ball, Sales Manager of the Norfolk district and formerly of the Hopewell office, is in charge of the recently opened Norfolk office.

Gillam Joins Midwest Research Institute Staff

Dr. W. S. Gillam, professor of agricultural chemistry at Purdue University, Lafayette, Ind., has joined the staff of the Midwest Research Institute, Kansas City, where he will specialize in research in soils, plant nutrition and analytical services. He was formerly on the faculty of Michigan State College, Lansing, Nebraska Wesleyan University and University of Nebraska, Lincoln.

FERTILIZER TAX TAG SALES

State	August				January–August		
	1945 Tons	1944 Tons	1943 Tons	% of 1944	1945 Tons	1944 Tons	1943 Tons
Virginia	50,020	35,342	22,783	123	464,634	376,835	352,882
North Carolina	15,840	11,832	4,200	110	1,170,972	1,065,193	1,094,485
South Carolina	10,790	4,550	4,320	108	677,255	624,523	700,768
Georgia	14,445	12,745	4,754	105	907,773	866,861	876,829
Florida†	44,129	39,454	24,607	102	530,648	521,969	436,776
Alabama	15,000	9,200	3,500	114	632,800	557,400	623,050
Mississippi	19,250	5,030	44,050	108	329,707	306,664	379,044
Tennessee	14,450	15,814	8,439	111	242,185	219,080	192,653
Arkansas	2,000	1,500	16,000	105	108,400	103,483	156,975
Louisiana	3,050	1,050	750	98	132,436	134,720	145,188
Texas	3,500	1,703	892	108	153,285	142,244	131,127
Oklahoma	1,950	2,300	2,000	128	18,362	14,351	17,088
Total South	194,424	140,520	136,295	109	5,368,457	4,933,323	5,106,865
Indiana	44,423	46,927	76,290	110	347,617	316,088	357,530
Illinois	25,400	17,250	8,143	144	178,939	124,540	76,744
Kentucky	9,188	20,773	11,501	114	236,821	207,294	135,502
Missouri	40,183	32,934	24,444	119	134,966	113,238	75,260
Kansas	7,300	4,500	3,563	96	31,305	32,746	11,904
Total Midwest	126,494	122,384	123,941	117	929,648	793,906	656,940
Grand Total	320,918	262,904	260,236	110	6,298,105	5,727,229	5,763,805

†Revised by eliminating the tonnage of raw phosphate rock and liming materials for earlier periods.

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A. A. WARE, Editor
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K. F. WARE, Advertising Manager
E. A. HUNTER, Southern Advertising Manager
2246 E. Lake Road, N. E.,
Atlanta, Ga.

REPRESENTATIVES
WILLIAM G. CAMPBELL
1123 W. Madison St., Chicago, Ill., Phone—Randolph 4780
ROY M. McDONALD
564 Market St., San Francisco, Calif., Phone—Garfield 8966
541 S. Spring St., Los Angeles, Calif., Phone—Tucker 7981

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Agricultural Outlook

The domestic market for farm crops is likely to remain good for two or more crop years, according to agricultural economists. The buying power of the consuming public is likely to decrease as the result of the closing of war plants, but is expected to increase as manufacturing plants are again adjusted to production against a shortage of supplies of many commodities. Since the market for farm products will largely follow the trend of industrial employment, it may be expected to remain good until civilian demands for goods are fully met. No one can tell when that will be.

Creation of permanent jobs for 60 million men is a dream that everyone wishes might come true but on which no one is counting.

World markets for American farm products would be good if there were means for converting world needs into trade. With lend-lease out, farm products of the United States can enter into world trade only to the extent that the war-depleted nations can raise cash or offer goods in exchange. Cash, of course, is scarce, and it will take time for European countries to repair their manufacturing plants and produce goods above home needs, for exchange in trade. The market for supplying world needs for farm products is therefore not promising.

Farmers of the United States are girding for what may be in store. The war has taught lessons in agricultural production that will not be forgotten. Farmers have learned to produce more with less manpower.

Labor-saving machinery and liberal fertilization of crops have demonstrated very clearly that not only more can be obtained per unit of manpower but more per acre, and at lower cost per bushel, bale, pound or other unit of measure.

Government price support on corn, wheat, oats, rice, tobacco and peanuts at 90 to 92.5 per cent of parity, and 90 per cent on hogs, poultry, dairy products and cured sweet potatoes will continue according to act of Congress until the expiration of "the two-year period beginning with the first day of January immediately after the date on which the President by proclamation or Congress by concurrent resolution declares that hostilities in the present war are terminated." Such action by the President or Congress has not yet been taken so it is certain that support prices for farm products will be continued more than two years from V-J day, and

guarantees to the farmer a fair price for his basic commodities for that period.

In facing the future, farmers are aware of the necessity of making readjustments in land uses. The southern farmer seems to have decided that less acreage must be devoted to cotton in view of the accumulated surplus of cotton lint, the growing popularity of synthetic fibers, and the fact that other nations of the world are insisting on growing cotton with low cost labor. The reduced acreage of cotton in 1945 is apparently not an accident but a definite trend.

It may be noted, however, that the reduction in cotton acreage has not been accompanied by a reduction in the demand for fertilizers in the Cotton Belt. In fact, crops like tobacco and truck are consuming more fertilizer per acre than cotton. The shift to livestock is calling for as much or more fertilizer per acre for pastures and feed crops as was used as an average on cotton.

Readjustments in farming programs may, after all, be the occasion for no alarm to the fertilizer manufacturer. It is well known that what is best for the farmer is best in the long run for the producer of plant foods.

No Action by Co-op. Council on Fertilizer Bills

At its meeting on September 7th and 8th, the Executive Committee of the National Council of Farmer Cooperatives decided to take no action on the report of its fertilizer subcommittee, which recommended that the Council oppose the government expanding its operations in the field of fertilizer production and distribution. As the various member organizations of the Council had not had time to express their opinions on the report, the Council was unable to adopt it as the bylaws require unanimous approval by the member organizations before any policy can be adopted by the Council.

The report of the subcommittee urged that production and distribution of fertilizers be carried on by private industry, including farmer cooperatives, and that government production be limited to research and pilot plant operation and for the demonstration of new materials. The Committee recommended that the government assist in the exploration of new phosphate and potash deposits; also that State fertilizer control officials cooperate in reducing the number of grades sold and in eliminating low analysis fertilizers.

Ban on Conventions Lifted

The ban on conventions, group meetings and trade shows will be removed October 1st, Col. J. Monroe Johnson, chairman of the War Committee on Conventions and Director of the Office of Defense Transportation, announced September 11th.

The ODT director asked sponsors of conventions, group meetings and trade shows to defer meetings whenever possible and to keep necessary meetings small until after the peak of the troop movement, which will come early next year.

July Superphosphate Production

The Bureau of Census figures for the superphosphate industry during July show a production of 611,388 tons of 18% superphosphate, 21,251 tons of 45% concentrated superphosphate, and 2,332 tons of base goods, 18% A. P. A. The amount shipped and used in producing plants totaled 578,213 tons of 18% superphosphate, 21,136 tons of 45%, and 1,424 tons of base goods. Stocks on hand at the end of the month were 752,160 tons of 18%, 28,563 of 45%, and 3,234 tons of base goods.

The above production figures show a slight decrease from the June figures for the two forms of superphosphate and over 100% increase in base goods. Production of the 18% grade, however, was more than 20% higher than for July, 1944.

Obituary

Fred L. Pearsall

Fred L. Pearsall, president of Pearsall and Company and a director of the Wilmington Oil and Fertilizer Co., Wilmington, N. C., died at his summer home on September 15th.

Mr. Pearsall, who was 71 years of age, was born in Wilmington and received his education at Fishburne's Military School and the University of North Carolina. In 1920, he succeeded his father as president of Pearsall and Company, and served in this capacity for the past 25 years. He is survived by his wife, Mary McA. Pearsall; one daughter, Mrs. J. W. Smith; three brothers and three sisters.

September Cotton Report

As of September 1, 1945, the Crop Reporting Board of the United States Department of Agriculture estimated the year's cotton yield at 10,026,000 bales of 500 pounds each. This is 108,000 bales, or 1 per cent, less than the estimate made in the August 1st forecast.

Compared to the yield of 1944, this year's crop is 2,204,000 bales less, and compared with the average yield for the ten-year period of 1931–43, the 1945 yield is 2,267,000 less.

The indicated acre yield as estimated by the Crop Reporting Board, at 267.2 pounds of lint per acre, compared to 293.5 pounds for 1944 and to 231 pounds for the ten-year average (1931–43).

Abandonment of cotton in cultivation is estimated at 1.9 per cent, about the same as for the ten-year average. The total acreage left for harvest was 18,008,000 acres. This is 10 per cent less than the acreage harvested in 1944 and the smallest for any year since 1885.

The Crop Reporting Board, figuring on the usual ratio of lint to cottonseed that has prevailed for the past five years, places the production of cottonseed at 4,135,000 tons.

State	Production (Ginnings)[1] 500 lb. gross wt. bales		
	Average 1934–1943	1944	1945 Crop Indicated Sept. 1
	Thous. bales	Thous. bales	Thous. bales
Missouri	348	411	180
Virginia	28	29	22
North Carolina	604	710	460
South Carolina	755	864	670
Georgia	972	810	625
Florida	24	13	9
Tennessee	498	562	450
Alabama	1,010	1,006	900
Mississippi	1,677	1,937	1,750
Arkansas	1,322	1,394	1,300
Louisiana	643	620	460
Oklahoma	565	634	450
Texas	3,112	2,646	2,100
New Mexico	109	116	118
Arizona	185	136	135
California	424	327	385
All other	18	15	12
United States	12,293	12,230	10,026
Amer. Egypt[2]	34.2	8.8	4.3

[1] Allowances made for interstate movement of seed cotton for ginning.

[2] Included in State and United States totals. Grown principally in Arizona, New Mexico, and Texas.

The Bureau of Census reports 461,280 bales of cotton ginned from the 1945 crop, prior to September 1st, compared with 576,999 bales for 1944, and 1,785,245 bales for 1943.

Airplane Used in Applying Seed and Fertilizers

An interesting experiment in applying seed and fertilizers with an airplane to range lands of Arizona is announced.

Seed of Lehman's love-grass is incorporated along with fertilizers in small clay particles and scattered over an area of prepared lands. To guard against the seed being eaten by birds and rodents, a repellant is incorporated in the clay particles.

Some 50,000 acres of public domain and Indian reservation land are to be seeded and fertilized from the air. If the experiment is a success, it is predicted by agricultural authorities that it will come into general use on range lands of the west for planting grasses and other range plants.

Farmers' Expenditures for Fertilizer and Lime

Farmers in the United States spent $476 million in 1944 for fertilizer and lime, according to a report of the United States Department of Agriculture. In that same year farmers spent $2,078 million for feed, $816 million for livestock, $831 million for gasoline and other motor vehicle operating costs, $2,094 million for hired labor, and $475 million for taxes.

Expenditures for fertilizer and lime in the entire country were equivalent to 2.1 per cent of total gross farm income. This radio varied widely in the different sections of the country. It was highest in the heavy fertilizer using areas in the East and South and lowest in the mountain region of the West. The regional percentages are as follows: New England, 3.6 per cent; Middle Atlantic, 3.3 per cent; South Atlantic, 6.3 per cent; Gulf Central, 3.9 per cent; Gulf Western, 1.0 per cent; East North Central, 1.9 per cent; West North Central, 0.4 per cent; Rocky Mountain, 0.4 per cent; Pacific Coast, 0.9 per cent.

Fertilizer consumption in 1944 was about 70 per cent greater than it was in the 1935–1939 period. If fertilizer prices had risen as much in this war as in the first world war, or had risen as much as prices of farm products, farmers' expenditures for fertilizer in 1944 would have been substantially greater than they were.

Contact Acid in the Fertilizer Industry

By Nicolay Titlestad*

Only relatively few manufacturers of superphosphate have so far made use of the contact process for the manufacture of sulphuric acid for fertilizer purposes. In those cases where contact plants are employed, large units have been installed, and the locations of the plants have been such that a considerable portion of the acid could be marketed as 98 per cent acid or oleum at profitable prices to other industries. It has mostly been contended that the contact process is too expensive, not only in installation cost but also in operating cost, as compared with the chamber process. This has been true, in particular in the case of small units, while for large size units both first cost and operating cost have been lower than for chamber plants of the same size. Another point has also played a part, namely, the space requirement of a chamber plant as compared with a contact plant. Large size contact plant units occupy only a fraction of the space of a chamber plant of the same capacity, for which reason contact plants are usually considered in such cases.

The comparisons of cost of acid plants by the contact process and chamber plants process have, however, not always been made in a commensurate manner, due to the fact that in the cost of the contact plants a high figure was usually included by the vendors to cover special knowledge, high overhead and profits. If compared on the same basis for materials, engineering and profit, there is little difference in cost of a contact plant and a chamber plant. This refers to first cost as well as operating cost. In the future, there are reasons to believe that contact plants can be obtained at lower prices per ton of acid than chamber plants, so that contact plants may gradually replace chamber plants. It has been contended that the contact plant is more difficult to operate, and that the amount of time to be allowed for shut-down for repairs is more than for chamber plants. Generally this should not be the case. If it is so, poor operation, resulting from inadequate training or instruction, is usually the cause. It is interesting to note that several plants have been operated practically uninterruptedly for a series of years with repair and maintenance cost per ton of acid so low that I believe it cannot be matched by any chamber acid plants.

There are, however, some weaknesses in the present contact plants, which have been the major cause of the troubles often encountered. One of them is the peculiarity of the heretofore used contact masses to plug up under certain operating conditions, peculiarly under those conditions which theoretically give the highest conversion efficiency. The efficient operators have, therefore, often had more trouble than the less efficient ones. When plugging of the converter takes place, it is either necessary to rescreen the mass, or to loosen the mass by raking, which in either case requires a shut-down of the plant.

A new type catalyst, based upon an entirely new and different procedure in preparation, has lately been developed. This catalyst does not possess the same weaknesses in this respect as the other catalysts. The work has now so far progressed that the catalyst may be marketed in the near future. This catalyst is much lighter in weight than the present catalysts, due to a rather high porosity. Its conversion efficiency is about the same as for the present catalysts. Indications are that this particular catalyst is more resistant to foreign materials such as water, vapors, acid, mist, etc., than the present ones.

Another weakness or source of trouble with contact plants has been the waste heat boilers. The trouble is mostly caused by negligence, or due to use of improper boiler feed water. But some of the troubles have also been due to the selection of the wrong type of boilers. Where steam is available, steam boilers can be eliminated and the gas cooling is done in cast iron air-cooled coolers. In very small plants, this is most satisfactory. In medium and larger plants, however, the gas cooling is done cheaper and more efficiently with boilers, as in this case sufficient steam can be produced to operate the main machinery, whereby considerable annual saving in power cost is accomplished.

With use of a better catalyst and proper selection of boiler and accessories, much if not all of the present trouble can be eliminated. There is little doubt, therefore, that in the future the contact plants should be able to compete with chamber plants of almost any size and at any location both as far as the initial construction cost is concerned as well as in operating cost. Besides this, the contact plant produces acid of higher strength, which in many instances can be sold at profitable prices to oil refineries as well as to the chemical industry.

*Chemical Engineer, 103 Park Ave., New York, N. Y.

International Minerals & Chemical Reports Good Year

In making public the thirty-sixth annual report of International Minerals & Chemical Corporation, President Louis Ware has reported net sales of $30,301,091 for the fiscal year ending June 30, 1945. This was an increase of $2,916,424, or 11 per cent, over the 12 months ended June 30, 1944, and an increase of $7,823,716, or 35 per cent, over a corresponding period ended June 30, 1943.

In a letter to stockholders, accompanying the report, Mr. Ware pointed out net profit after all charges for the 1945 fiscal year amounted to $2,038,169, as compared to $2,016,037 for the previous corresponding period. Earnings per common share presently outstanding, after preferred dividend requirements, as of June 30, 1945, were $2.76, compared with $2.73 for the year ended June 30, 1944.

Mr. Ware said: "During the year the corporation's mines, chemical plants and fertilizer factories were operated at or near capacity. The larger volume of output and sales made possible the realization of profits comparable to the two previous years, even with higher labor expense and other conditions that added to cost of production.

"At the end of the war International's mines and plants are in better condition than ever before. Reconversion to peacetime operation is no problem because we continue to produce the same goods in the same plants.

"Heavy demand for food and agricultural products, not only in the United States but for our armies of occupation and the war-devastated countries, can be expected to continue during the coming year. The need for the minerals and chemicals which the corporation produces does not terminate abruptly with the war end. When the lessening of demand from the high rate of production for war occurs," Mr. Ware explained, "the mines and plants are in condition to be adjusted to efficient operation at lower rates of output. Progress toward expansion into new production as a result of research has been realized, and the corporation has plans for further diversification of its business.

"During the war, our facilities, our productiveness and usefulness have been greatly expanded. Export and specialized personnel have been added and, with expanded sales, we have served new customers and made new friends.

"Minerals and chemicals for plant food, animal feed and human nutrition is the specialized field of the corporation," Mr. Ware pointed out. "To mine and refine minerals and to manufacture chemicals . . . basic, useful products . . . of the highest quality, most economically and efficiently produced, is the peacetime program ahead.

"Despite shortage of raw materials, labor scarcity and other wartime difficulties, fertilizer volume and earnings were maintained at about the previous year's level.

"A modern fertilizer plant is being constructed at Mason City, Iowa, to meet the growing demand for International fertilizers in the Iowa and Minnesota areas. It will be in operation in 1946. With the shortage of food and agricultural products that now exists, it is believed demand for our fertilizer will permit continued capacity operation of the plants during the coming year.

"Sales of the Potash Division were 14 per cent above last year. Added volume has offset increased labor costs so that in spite of continuing fixed selling prices, the Division has maintained its net operating profits comparable with recent years. Expenditures of $420,000 during the year for additions to the mine and refinery have improved recoveries and volume.

(Continued on page 30)

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FERTILIZER MATERIALS MARKET

NEW YORK

Sulphate of Ammonia Production Suffers Serious Drop. Supplies of Nitrate of Soda Adequate. Phosphate Rock Situation Satisfactory but Labor Shortage Hampers Production of Superphosphate and Potash.

Exclusive Correspondence to "The American Fertilizer"

NEW YORK, September 19, 1945.

Sulphate of Ammonia

There has been no improvement in the sulphate of ammonia picture during the past weeks. It is estimated that production is now running at about 11,000 tons per week, which is about 30 per cent below the level which was maintained throughout the war. Producers are behind schedule in their contract shipments and reserve supplies are nonexistent. Demand continues strong and buyers are looking for additional supplies but without success.

Nitrate of Soda

The supply is adequate to meet all current seasonal requirements, which are higher than usual for this time of year. Imports of Chilean nitrate are continuing to arrive and a good reserve supply is being maintained.

Organics

The situation in organic materials is still extremely tight. Supplies are at very low levels and shipments are going principally to the feeding trade. In spite of the high ceiling prices, fertilizer manufacturers are bidding for material but very little is available.

Phosphate Rock

Conditions are encouraging in the phosphate rock field. Production is adequate to meet all demands from acidulators and both water and rail facilities are sufficient to take care of shipments. High grade rock, which is preferred by most superphosphate producers, is becoming scarcer. Export inquiries continue active.

Superphosphate

There is still an active demand for superphosphate as mixers are accumulating supplies in anticipation of an early season for mixed fertilizers. Labor shortage is still a problem and in some sections the supply of sulphuric acid has been curtailed by the closing of ordnance plants. Concentrated superphosphate is still tight, in spite of the cancelling of Lend-Lease, which took a good portion of the output. Possibly UNRRA will be in the market for this material for distribution in their European program.

The lifting of allocation has made little difference in the potash situation. Current output for the next several months has been contracted for and transportation facilities are adequate to keep shipments on schedule. There is still a shortage of labor but this problem may be solved in the coming months as the country changes from a war to a peace basis.

CHARLESTON

Organics Situation Getting Worse. Sulphate of Ammonia Production Drops. High Grade Phosphate Rock Scarce.

Exclusive Correspondence to "The American Fertilizer"

CHARLESTON, September 17, 1945.

Organics.—The tight situation on organics is getting even worse, for now the manufacturers are finding that it is extremely difficult to get any supplies of cottonseed meal or soy meal.

Sulphate of Ammonia.—This continues extremely tight. While production rose to 67,327 tons in July, this was still about 2,000 tons less than July, 1944, and the stock at the end of July amounted to approximately 27,000 tons, as compared with approximately 75,000 tons at the end of July, 1944.

Castor Pomace.—The supply of this continues extremely tight. Nothing is moving except on previous contracts.

Nitrogenous.—No shipments are being made except against contracts already existing.

Phosphate Rock.—Shipments of this continue extremely heavy. High grade rock is far from plentiful.

Fertilizer Materials

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Spending $2.50 to Save $10

Paying $2.50 an acre for fertilizer that would not increase the yield of the trees in a tung orchard proved good business for the grower as measured by results reported by the U. S. Department of Agriculture. It is the kind of good business management with intelligent attention to costs that will be needed if tung growers are to be able to meet Asian competition once the war in the Pacific is ended. The expenditure of $2.50 an acre was for a low-cost phosphate fertilizer. Earlier tests in the orchard showed no gain in yield from phosphate fertilizer. The soil had enough phosphate to meet the light needs of the tung trees. The soil, however, did not have enough phosphate to supply the heavier demands of a cover crop of winter legumes. The tung orchard did need nitrogen fertilizer, and by supplying phosphate the grower encouraged a good cover crop. This drew from the air nitrogen that would have cost up to $10 an acre in the cheapest commercial form. "This certainly proved a big fertilizer bargain for the grower," the report comments. The orchard also benefitted from the organic matter turned under in the spring. Other soils, of course, may have phosphorus enough to supply a cover crop and would not need the phosphate application as a way of getting $4 value for $1.

CLASSIFIED ADVERTISEMENTS

Advertisements for sale of plants, machinery, etc. and for help and employment in this column, same type as now used, 60 cents per line, each insertion.

SITUATIONS WANTED

SUPERVISING CHEMIST, with major potash company, desires a position as sales representative with potash, phosphate, or nitrogen manufacturer. Background in soil science. Age, 29. Address "155," care of THE AMERICAN FERTILIZER, Philadelphia 7, Pa.

QUALIFIED mixed fertilizer, feed or fertilizer material executive or salesman available immediately. Years of contact with Florida feed and fertilizer manufacturers. Twenty-five years' experience in fertilizer industry. Age, forty; married, pleasing personality. Address "160," care THE AMERICAN FERTILIZER, Philadelphia 7, Pa.

MAINTENANCE MAN or plant engineer with wide experience. References furnished. Address "165," care THE AMERICAN FERTILIZER, Philadelphia 7, Pa.

Fudge Appointed Texas State Chemist

Dr. J. F. Fudge succeeded Dr. G. S. Fraps as Chief of the Division of Chemistry and State Chemist of Texas when the latter retired on August 31st. Dr. Fudge received the B.S. degree in agronomy at the University of Illinois and the Ph.D. degree in soil chemistry at the University of Wisconsin. Before coming to Texas, he was employed as a chemist at the Alabama and Florida Agricultural Experiment Stations. He has been connected with the Division of Chemistry of the Texas Agricultural Experiment Station since 1929.

India Decreases Cotton Production

Production of cotton in India for the 1944–45 crop year is placed at 2,965,000 bales, grown on 14,803,000 acres. This is a decrease of 30 per cent below 1943–44. The average annual production for the period of 1935–39 was 4,643,000. The decrease is attributed to diversion of cotton land to food crops.

Manufacturers' Sales Agents for **DOMESTIC**

Sulphate of Ammonia

Ammonia Liquor :: Anhydrous Ammonia

HYDROCARBON PRODUCTS CO., INC.

500 Fifth Avenue, New York

CHICAGO

Fertilizer Organics in Good Demand but No Supplies Available. Some Improvement in Feed Material Situation.

Exclusive Correspondence to "The American Fertilizer"

CHICAGO, September 17, 1945.

No fertilizer tankage has as yet appeared on the market, though demand is strong. Constant call for steamed bone meal is being made without finding sellers. Nitrogenous is wanted by mixers but no offerings are in sight.

Increased cattle receipts have somewhat improved production of feeding tankage material; demand remains in excess of supply. Prices for meat scraps and tankage are firmly held at ceiling prices.

Ceiling prices are:

High grade ground fertilizer tankage, $3.85 to $4.00 ($4.68 to $4.86 per unit N) and 10 cents; standard grades crushed feeding tankage, $5.53 per unit ammonia ($6.72 per unit N); blood, $5.53 ($6.72 per unit N); dry rendered tankage, $1.25 per unit of protein, f. o. b. producing points.

Dr. Bailey Retires

Dr. E. Monroe Bailey, chief of the analytical chemistry department of the Connecticut Agricultural Experiment Station for 28 years, will retire on October 1st. He entered the Station laboratory as assistant chemist in 1902 and became head of the department in 1917.

As head of the analytical chemistry department, Dr. Bailey had charge of all feed and fertilizer inspection and analyses for the State, and analytical work in connection with the enforcement of State food, drug and cosmetic laws. His department is the State's laboratory for work of this kind, with the State Dairy and Food Commission acting as the enforcing agency.

Dr. Bailey served as president of the Association of Official Agricultural Chemists during 1930. He was chairman of the editorial committee for the 4th and 5th editions of *Methods of Analysis*, the Association's official volume of standard analytical practice.

Boynton Joins Ashcraft-Wilkinson Staff

R. S. Boynton, chief of the lime and boron chemicals unit of the Chemicals Bureau of the War Production Board resigned September 12th to become associated with Ashcraft-Wilkinson Company, Atlanta, Ga., in its industrial chemicals department. Mr. Boynton has been with WPB for almost two years, having joined the Inorganics Branch of the Chemicals Bureau in November, 1943.

Water Freight Rates on Phosphate Rock and Sulphur Set

Establishment of new rates on shipments of phosphate rock and sulphur in bulk from Florida and Gulf ports to North Atlantic ports have been announced by the War Shipping Administration, effective on loadings completed on and after August 10th.

Rate Order No. 376 provides the following rates on shipments of phosphate rock in bulk from Florida ports:—to Norfolk, $4 a ton; to Baltimore, $4; to Philadelphia, $4.70; to New York, $5.25; to Boston, $5.50; to Portland, $5.50; and to Searsport, $5.50.

Rate Order No. 377 provides the following rates on sulphur in bulk from Gulf ports:—to Hampton Roads or New York range, $7.75 a ton; to north of New York, but not north of Searsport, Me., $8; to Canadian ports, $9

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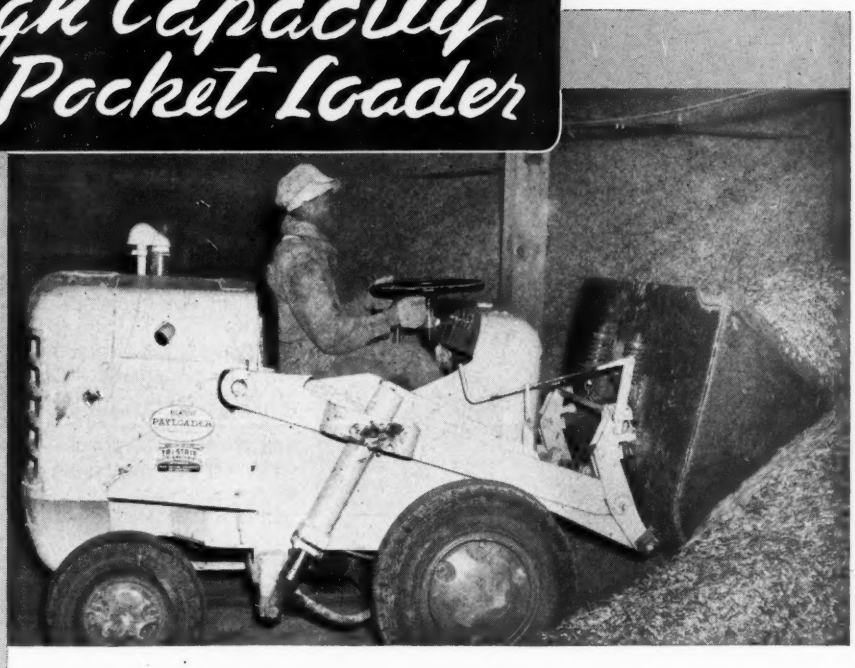

The Hough Model "HA" Payloader completely fulfills the need of the fertilizer industry for a compact, readily maneuverable loader for handling bulk materials economically. The "HA" Payloader is the result of many years of development work and exhaustive operating tests. It has already proved itself in nearly a hundred fertilizer plants.

Maneuverability reaches a new high with this unit. It loads and operates with ease and thoroughness in and out of a box car, the overall width is only 49", the wheel base 48½" and the turning radius only 6'6". One man with the "HA" Payloader loads bulk material, carries it 100 feet and dumps it at a rate of 25 to 50 tons per hour. It will do the work of 8 to 10 men.

The "HA" Payloader is a rugged powerful tractor unit—not an attachment for a tractor. Power is furnished by a heavy duty 4 cylinder 29 H.P. engine. Two speeds forward and two reverse provide ample flexibility and speed of movement. The bucket is hydraulically actuated by twin cylinders and has the exclusive tip-back feature which prevents spillage.

The Model "HA" Payloader is the material handling unit you have been waiting for. There are over 3500 Hough Loaders in service.

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Fertilizer Recommendations for Louisiana

In the annual report of the Louisiana Experiment Stations, a comprehensive list of fertilizer recommendations for the principal Louisiana crops is given by M. B. Sturgis, head of the Agronomy Department, as follows:

Cotton

On river bottom soils use 30 to 42 pounds of nitrogen per acre applied before planting or as a side-dressing. Where available phosphorus is low, use 350 to 400 pounds per acre before planting of a 10–6–4 or 12–8–0. On alluvial soils where rust is prevalent, especially in the Ouachita, Bartholomew and Pouef River bottoms, use 300 to 400 pounds of 12–0–12, 10–0–10, or 9–6–9; or 600 pounds of 6–8–8 per acre before planting.

On soils of Coastal Plain, Coastal Prairies and Mississippi Terraces (Loessial Hills) where rust is not prevalent, use 400 to 600 pounds per acre of an 8–8–8, 6–9–6, or 5–10–5 applied at or before planting.

On Coastal Plain soils in the hilly areas, having heavy reddish sub-soils, use 400 to 600 pounds of 6–8–4.

On soils of Coastal Plain, Coastal Prairies, and Mississippi Terraces (Loessial Hills) where rust is prevalent, use 400 to 600 pounds of an 8–8–8, 6–8–8 or 4–8–8 per acre. If the initial application supplies less than 30 pounds of nitrogen, bring the total nitrogen application up to 30 to 36 pounds per acre by side-dressing.

Corn

On heavier and more fertile river bottom soils, side-dress with 45 pounds of nitrogen per acre. For corn on lighter river bottom soils, such as very fine sandy loams, use 300 pounds per acre of 4–8–8, 6–8–8, or 8–8–8 applied under before planting and side-dress with 30 pounds of nitrogen.

On the soils of the Coastal Plain, Coastal Prairies and Mississippi Terraces, use 300 pounds per acre of a 4–8–8, 6–8–8 or 8–8–8 and side-dress with 30 pounds of nitrogen.

Rice

On the lighter colored silt loams and very fine sandy loams low in organic matter, use 300 pounds per acre drilled in with or below the seed of 6–9–6, 6–8–8, 5–10–5, or 4–12–8. On the darker colored silty clay loams, clay loams and soils just recently put in rice, use 200 to 300 pounds per acre of 4–12–8 or 5–10–5. On muck soils use 200 pounds per acre of 0–14–7 or phosphates only.

Sugarcane

For stubble cane in all areas, except where known deficiencies of phosphorus and potassium exist, use 36 to 42 pounds of nitrogen per acre. For plant and stubble cane in all areas of low productivity: (1) where only nitrogen is deficient, apply 36 to 42 pounds of nitrogen per acre; (2) where nitrogen and phosphorus are deficient, apply 300 to 400 pounds of a 12–8–0 or 10–6–4 per acre; (3) where nitrogen, phosphorus, and potassium are deficient, apply 300 to 450 pounds of 12–8–12 or 9–6–9 per acre; and (4) where nitrogen and potassium are deficient, apply 300 to 400 pounds of 12–0–12 or 10–0–10 per acre.

Oats

On river bottom soils use 45 pounds of nitrogen per acre as a top-dressing. On the soils of the Coastal Plains, Coastal Prairies, Mississippi Terraces and the lighter, very fine sandy loams of the river bottoms, use 300 pounds per acre of a 4–8–8, 6–8–8, or 8–8–8 applied under before planting and top-dress with 30 pounds of nitrogen.

Peanuts

Use 300 to 400 pounds per acre of a 4–12–8 or 3–12–12.

Soybeans

On Coastal Plain, Mississippi Terrace and Coastal Prairie soils, use the same fertilizers as recommended for peanuts. On heavier soils, use 300 to 400 pounds of 0–14–7 or 0–12–12 per acre. Soybeans on river bottom soils usually do not require fertilization.

Lespedeza

On lighter colored soils which are low in organic matter, use 300 to 400 pounds per

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A Complete Service

THE strategic factory locations of the American Agricultural Chemical Company, as shown on the accompanying map, assure prompt, dependable service for the complete line of products listed below.

We manufacture all grades of Commercial Fertilizers, Superphosphate, Agrinite Tankage, Bone Black, Bone Black Pigments (Cosmic Black), Dicalcium Phosphate, Monocalcium Phosphate, Gelatin, Agricultural Insecticides (including Pyrox, Arsenate of Lead, Calcium Arsenate, etc.), Trisodium and Disodium Phosphate, Phosphorus, Phosphoric Acid, Sulphuric Acid, Ammonium Fluosilicate, Magnesium Fluosilicate, Zinc Fluosilicate, Salt Cake; and we are importers and/or dealers in Nitrate of Soda, Cyanamid, Potash Salts, Sulphate of Ammonia, Raw Bone Meal, Steamed Bone Meal, Sheep and Goat Manure, Fish and Blood. We mine and sell all grades of Florida Pebble Phosphate Rock.

FACTORIES

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Baltimore, Md.	Detroit, Mich.	Pensacola, Fla.
Buffalo, N. Y.	East St. Louis, Ill.	Pierce, Fla.
Carteret, N. J.	Greensboro, N. C.	Port Hope, Ont., Can.
Cayce, S. C.	Havana, Cuba	Savannah, Ga.
Chambly Canton, Quebec, Can.	Henderson, N. C.	Searsport, Maine
	Montgomery, Ala.	South Amboy, N. J.
Charleston, S. C.	Norfolk, Va.	Spartanburg, S. C.
Cincinnati, Ohio		Wilmington, N. C.

The AMERICAN AGRICULTURAL CHEMICAL Co.

50 Church Street, New York 7, N. Y.

SALES OFFICES

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Baltimore, Md.	Detroit, Mich.	Montgomery, Ala.	Port Hope, Ont., Can.
Buffalo, N. Y.	East St. Louis, Ill.	Montreal, Quebec, Can.	Savannah, Ga.
Carteret, N. J.	Greensboro, N. C.	New York, N. Y.	Spartanburg, S. C.
Charleston, S. C.	Havana, Cuba	Norfolk, Va.	Wilmington, N. C.
Cincinnati, Ohio	Henderson, N. C.	No. Weymouth, Mass.	
Cleveland, Ohio	Houlton, Me.	Pensacola, Fla.	

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY · AA QUALITY

acre of a 3–12–12. On the heavier soils, use 300 to 400 pounds per acre of 0–14–7 or 0–12–12.

Pastures

For fall or winter planted mixed and clover pastures on all soils, except heavier soils of the river bottoms, use 400 pounds of 3–12–12 or 4–12–8 per acre. For spring applications, use 400 pounds per acre of 0–12–12 or 0–14–7. For the lighter bottom soils, such as very fine sandy loams, use 50 pounds of P_2O_5 in any of the common phosphates.

Grass Pastures, Sudan, etc.

On the soils of the river bottoms, apply 30 to 45 pounds of nitrogen per acre in one or more top-dressings. On the upland soils, apply before or at planting, 300 pounds per acre of 4–8–8, 5–10–5 or 6–8–8 and side- or top-dress with 20 to 30 pounds of nitrogen.

Potatoes and General Truck Crops

The Horticulture Department recommends the 4–12–4, 4–12–8 and 6–8–8 grades for Irish and sweet potatoes. The 4–12–4, 5–10–5 and 6–8–8 grades are recommended for general truck. The 4–12–8 and 6–8–8 grades are recommended particularly for the hill areas of the Coastal Plains. Specific recommendations for the amounts and times of application can be secured from the Horticulture Department.

The annual plant food requirements which should be met through the application of fertilizers to Louisiana soils are approximately: 33,000 tons of nitrogen, 50,000 tons of P_2O_5 and 40,000 tons of K_2O. In terms of the more common carriers, Louisiana should apply annually 495,000 tons of fertilizers for efficient crop production. In addition to this 300,000 tons of ground limestone and shell are needed annually to replace the losses and crop removals of calcium and magnesium.

Acid-Resistant Treatment for Wood

Structures exposed to rapid deterioration by contact with acid solutions or fumes can be made acid-resistant through use of Asidbar, a plastic-impregnated wood developed by Koppers Wood Preserving Technical Department, Orrville, Ohio.

In one application in a spray type pickling machine, Southern Yellow Pine guides treated by this process are subjected to a 10 per cent to 15 per cent sulphuric acid at temperatures of 180 degrees F. The acid-resistant wood is sound and firm after 18 months service. Untreated wood in this same application lasted only two to three weeks. Fume ducts exhausting the acid fumes from the same machine were built of acid-resistant treated wood, and have given similar service. Metallic alloy flues lasted only a short time. Untreated wood fell apart in these ducts after two weeks exposure.

Asidbar has also been used for construction of stacks to exhaust acid vapor and for covering the concrete floors and foundations under an elevated acid tank, to protect the concrete against acid spillage.

The plastic treating material is liquefied by high temperature and the wood being processed is immersed in the compound in sealed retorts. The plastic is forced deeply into the wood fibers by high pressure at temperatures sufficiently high to hold the compound in the liquid state. After the impregnation period of 10 to 20 hours, the compound sets-up to a plastic-solid distributed in the cells of the wood as it is allowed to cool, to produce the material known as Asidbar. The treatment increases the weight and hardness of wood, and gives it a black surface which need not be painted; resistance to wear and abrasion, water, and chemicals are considerably in-

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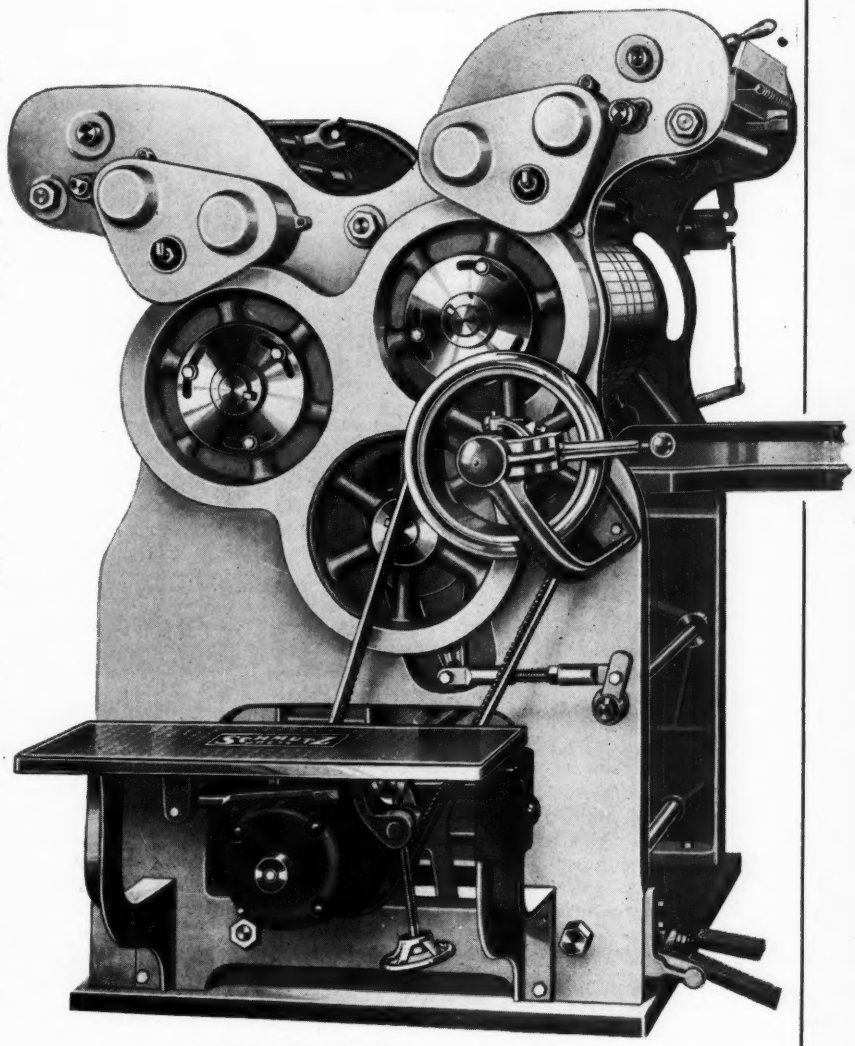
print your FERTILIZER BAGS *more attractively*

This new 1945 Model Bag Printer will print any size or type of bag made of paper, burlap, cotton or paper-lined material. It is built in one, two and three colors.

The highest type of printing can be done with this machine at the lowest possible cost. It will also do an excellent job of printing on used bags.

We are in a position to make prompt delivery on printing plates also printing inks for the Fertilizer industry.



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creased. The properties of Asidbar make it suitable for many requirements of severe service conditions at temperatures to 180 degrees F.

Wood thus treated can be installed with ordinary wood tools. In applications where wood expansion or shrinkage are detrimental the treatment substantially decreases changes of shape and dimension when subject to alternate wetting and drying. Wear resistance also is increased by the increased hardness and other properties given to the wood by the plastic which fills its fibers.

Industrial Safety Tomorrow

A specific program designed to help industry meet the threat of an increased accident toll under the changed conditions of the post-war period has just been offered by 38 national organizations interested in industrial safety.

The program is contained in a 16-page pamphlet, *Industrial Safety Tomorrow*, produced by the National Safety Council for the cooperating organizations. The sponsoring organizations include industrial management associations, labor unions, civic organizations, educational institutions and insurance associations.

Preparation of the pamphlet was handled by a special Committee on Post-War Industrial Safety, headed by C. R. Cox, president of the National Tube Company of Pittsburgh, Pa., a subsidiary of the U. S. Steel Corporation.

Highlights of the pamphlet, which can be obtained without cost from the National Safety Council, Chicago 6, Illinois, include:

"Accident prevention in American industries has reached a new high since Pearl Harbor. Under the patriotic urge to 'save manpower for warpower,' employers have intensified their efforts. Labor . . . government agencies . . . insurance companies . . . have given encouragement and technical assistance. As a result, fewer workers were killed in occupational accidents in 1944 than in 1941. . . .

"The post-war era will present new situations, new problems and new opportunities. Will this mean losing ground already gained? Or will it mean consolidating and extending these gains? The answer depends largely on the forethought and the advance planning of the individual plant or company. . . .

"Reconversion, availability of new materials, and expansion offer unparalleled opportunities to build safety into the plant. Neglect of the opportunities . . . will create fixed hazards. . . .

"The considerations just mentioned apply equally to machinery, tools and other equipment. These . . . have suffered from lack of adequate maintenance. . . . Guards of a temporary nature, those built of substandard materials, and obsolete guards require repair or replacement.

"Millions of workers are changing and will change from jobs which they learned to do safely to jobs whose techniques they must master. They will be in unfamiliar surroundings, often with incompletely organized supervision and inadequate equipment. . . . On the other hand, thousands of workers have learned new skills. . . .

"Most of the men and women returning from the armed forces are bringing new abilities and skills, greater maturity. . . . Some veterans, however, present readjustment problems, mostly minor and temporary . . .

"An effective safety program must have the wholehearted support of top management and employee acceptance and cooperation."

The pamphlet contains a detailed list of 32 main elements of an effective industrial safety program, grouped around the following topics:

Safety Organization
Inspections
Accident Records
First Aid and Medical Facilities
Buildings and Grounds
Machinery, Guards and Equipment
Personnel Selection and Training
Maintaining Interest
Re-employment of Service Men and Women
Off-the-Job Safety

The pamphlet stresses the need and opportunity for cooperative effort to prevent accidents. It points out that the individual com-

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"JAY BEE"

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50 H.P. to 200 H.P.

Puts Extra Peacetime Profits Into Your Plant

The greater need for peacetime crops requires speed-up in fertilizer production. "Jay Bee" grinds any material going into commercial fertilizers—fast, cool and uniform. Heavy all steel construction makes the "Jay Bee" Hammer Mill practically indestructible. Greatest capacity for H.P. used. Sizes and styles to meet every grinding requirement: 12 H.P. to 200 H.P. with belt, V-belt, and direct connected drives.

Write for complete details, prices, etc.
State your grinding requirement, please.

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. . . . WHEN BORON IS NEEDED TO CORRECT A DEFICIENCY OF THIS IMPORTANT SECONDARY ELEMENT

Agricultural authorities have shown that a lack of Boron in the soil can result in deficiency diseases which seriously impair the yield and quality of crops.

When Boron deficiencies are found, follow the recommendations of local County Agents or State Experiment Stations.

Information and references available on request.

AMERICAN POTASH & CHEMICAL CORPORATION
122 East 42nd ST., NEW YORK CITY
Pioneer Producers of Muriate of Potash in America

See Page 4

pany or plant can secure safety assistance from the following types of organizations:

1. Government agencies concerned with industrial safety and hygiene, fire and health.
2. Insurance companies, agencies and associations.
3. Machine manufacturers, suppliers of safety and other industrial equipment.
4. Civic, professional and commercial associations dealing with safety, health and fire, with business in general or with a particular industry.
5. Labor organizations.
6. Educational institutions, both technical and general.

After listing the specific services which such cooperating agencies can perform, the pamphlet concludes:

"The effective conduct of all these activities requires adequate, competent, well-trained personnel, and definite, adequate budgets. . . . Complete coordination and cooperation of all agencies is urgently needed if industrial accidents are to be reduced to a minimum."

Fertilizing Small Grains Pays Well

On most Missouri soils, applications of commercial fertilizer applied with fall-seeded small grains will hasten fall growth, thus providing more cover on the land. Such applications also aid in reducing winter-killing and disease damage, and in producing materially increased yields and better quality of grain.

The more rapid growth of fertilized small grains also will increase their livestock carrying capacity when used for pasture, points out A. W. Klemme of the University of Missouri College of Agriculture. Fertilizers are especially helpful in establishing and maintaining stands of clovers and grasses or mixtures of these when grown as companion crops with small grains.

The grade of fertilizer to use depends on the natural fertility of the soil, the previous soil treatments, crop grown on the land, and seedbed preparation. On the dark-colored soils of Northwest Missouri and the fertile river bottoms, or where manure has been applied this fall, superphosphate is usually all that is needed. On light-colored soils which have grown corn, sorgo, or small grain, or where wheat follows lespedeza—and where the seedbed is prepared a month or less before seeding—a complete fertilizer such as a 4–12–4, 4–12–8 or 3–12–12 is suggested.

On limed light-colored soils where clover or lespedeza has been grown the past year and seedbed preparation is begun a month or more before seeding, either 0–14–7, 0–20–10, 0–12–12 or 0–20–20 is recommended. Where sweet or red clover is to be sown in the small grain, the fertilizer with the higher potash content should be used.

Since most Missouri soils are usually lacking in available phosphorus, of which both small grains and legumes are heavy feeders, the rates per acre should be sufficient to supply at least 30 pounds of phosphate. This will require an application of 250 pounds per acre of 4–12–4, 4–12–8, 0–12–12, or 3–12–12, or 214 pounds of 0–14–7, or 150 pounds of 0–20–10, 0–20–20 or 20 per cent superphosphate. Heavier applications are recommended in many cases.

During the year 1944 there were 200,000,000 lbs. of vegetables frozen by commercial concerns for sale through retail stores and 400,000,000 lbs. of dehydrated vegetables going almost entirely to the Army. In order to get that amount of dehydrated food it was necessary to process about 2,000,000 tons of fresh vegetables.

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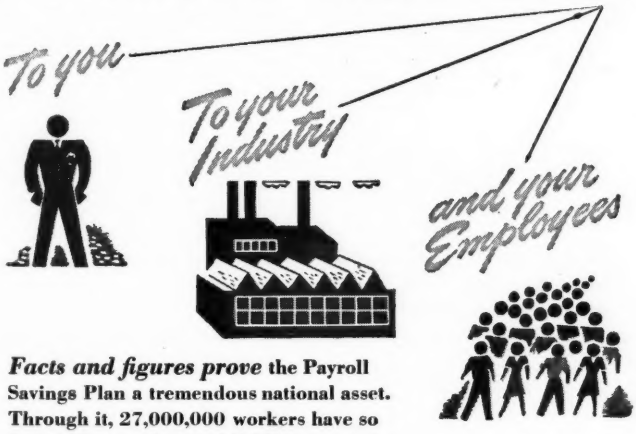

Facts and figures prove **the Payroll Savings Plan a tremendous national asset. Through it, 27,000,000 workers have so far saved more than $13½ billions to help speed victory . . . forestall inflation . . . and build peacetime prosperity!**

Yours is one of 240,000 companies maintaining a Payroll Savings Plan. While fostering national security, this combined effort is creating a lucrative postwar market for you . . . and all industry!

Enrollees in this plan total 76% of all industrial employees . . . averaging a $25 bond each month per individual.

Through this, millions now look forward to homes, educational opportunities and old age independence.

Surely, so great an asset is worthy of your continued . . . and increased . . . support! Now is the time to take stock of your Payroll Savings Plan. Use selective resolicitation to keep it at its 7th War Loan high . . . and build it even higher!

Soil Fertility Losses Through Erosion Enormous

H. H. Bennett, head of the Soil Conservation Service of the United States Department of Agriculture, says approximately 50 million acres of once productive land have been ruined for crop use, and another 50 million acres are in almost as bad condition, through erosion. Had this acreage been protected and divided into 80-acre farms, support for 1,250,000 families could have been obtained.

Something over 100,000 additional acres, largely still in cultivation, have lost all or the greater part of their productive topsoil; on yet other millions erosion is getting actively under way. Almost 470 million acres lost from one-half to three-fourths of the topsoil.

In addition to erosion losses, Dr. Bennett points out, there are serious losses by cropping, grazing, and leaching. The latest estimates, he says, indicate the annual loss from these causes at approximately 1½ million tons of phosphorus, 13 million tons of nitrogen, 18 million tons of potassium, 253 million tons of organic matter.

Dr. Bennett's figures indicate the greatness of the task not only of holding soils in place through erosion control measures but the restoration of fertility removed by crops and leaching.

Pennsylvania's Ten-Year Pasture Experiment Summarized

Pennsylvania Bulletin 460 entitled, *Pasture Fertilization*, summarizes results of a 10-year experiment on fertilizing seeded pastures at Kylertown, Pennsylvania. In this experiment involving eight treatments, all of which were limed to neutralize acidity, pasture yields and return per acre above cost of fertilizers were computed for phosphorus; phosphorus and potash; nitrogen, phosphorus and potash; and for single, double, and triple nitrogen applications, singly and factionally applied with P and K remaining constant. Where the returns were compared with equivalent total digestible nutrients from alfalfa hay at $16.00 per ton or corresponding values based upon milk returns at $2.00 per hundred weight, phosphate alone and phosphate and potash gave a substantial profit. Adding nitrogen to the mineral element did not increase the net return except where the high application was made, which was 72 lbs. of nitrogen per acre in two applications. The computed returns are over twice as high when based on milk production by this method as they are when compared with alfalfa. The basic values for the three major plant foods were N—24 lbs., P_2O_5—64 lbs., and K_2O—50 lbs. per acre.

World production of wheat is estimated at 5,400,000,000 bushels, which is 5 per cent less than 1944 and 8 per cent less than the 1935–1939 average. A sharp increase in export demand is expected for 1945–46.

INTERNATIONAL MINERALS AND CHEMICAL REPORTS GOOD YEAR

(Continued from page 16)

"The phosphate mines in Florida and Tennessee were operated at capacity during the year," Mr. Ware's letter went on. "The advantage of larger volume of production and improved recoveries resulted in an increase in the earnings of the Phosphate Division. The new mine in the Montana field started production and will be continued on a development and experimental basis. The present demand for phosphate continues high and it is believed the mines will operate at capacity during the coming year. Domestic users now require all of the output, but it is expected that profitable export business will be realized after ocean shipping can again be resumed.

"The Engineering Division during the year . . . designed three new fertilizer plants and planned for additions to several units. The electrical layout of the Carlsbad potash mine was adapted to purchase of outside power.

"The stockholders, employes and staff of International," Mr. Ware concluded, "can take pride in the corporation's wartime production of vitally needed phosphate, potash, fertilizer and chemicals."

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BATCH MIXERS — PULVERIZERS — CAGE MILLS — SCREENS — SCALES
ELEVATORS, AND ALL OTHER EQUIPMENT FOR COMPLETE PLANTS

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BUYERS' GUIDE • A CLASSIFIED INDEX TO ALL THE ADVERTISERS IN "THE AMERICAN FERTILIZER"

This list contains representative concerns in the Commercial Fertilizer Industry, Including fertilizer manufacturers, machinery and equipment manufacturers, dealers in and manufacturers of commercial fertilizer materials and supplies, brokers, chemists, etc.
For Alphabetical List of Advertisers, see page 33.

AMMONIA—Anhydrous and Liquor
Barrett Division, The, Allied Chemical & Dye Corp., New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Hydrocarbon Products Co., New York City.
Nitrogen Products, Inc., New York City

AMMONIUM NITRATE SOLUTIONS
Barrett Division, The, Allied Chemical & Dye Corp., New York City.

BAG MANUFACTURERS—Burlap
Bemis Bro. Bag Co., St. Louis, Mo.
Fulton Bag & Cotton Mills, Atlanta, Ga.
Mente & Co., Inc., New Orleans, La.

BAG MANUFACTURERS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.
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Fulton Bag & Cotton Mills, Atlanta, Ga.
Hammond Bag & Paper Co., Welisburg, W. Va.
Jaite Company, The, Jaite, Ohio
Raymond Bag Co., Middletown, Ohio.
St. Regis Paper Co., New York City.

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Huber & Company, New York City.
McIver & Son, Alex. M., Charleston, S. C.

BAG CLOSING MACHINES
St. Regis Paper Co., New York City.

BAG PRINUINNG—Machinery
Schmutz Mfg Co., Louisville, Ky.

BAGGING MACHINES—For Filling Sacks
St. Regis Paper Co., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.
Utility Works, The, East Point, Ga.

BONE BLACK
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
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BONE PRODUCTS
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
Huber & Company, New York City.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.

BORAX AND BORIC ACID
American Potash and Chem. Corp., New York City.

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
Dickerson Co., The, Philadelphia, Pa.
Hollingshurst & Co., Inc., New York City
Huber & Company, New York City.
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.

BUCKETS—Elevator
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

BUCKETS—For Hoists, Cranes, etc.
Hayward Company, The, New York City.

CARBONATE OF AMMONIA
American Agricultural Chemical Co., New York City
DuPont de Nemours & Co., E. I., Wilmington, Del.

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Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

CHEMICALS
American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Barrett Division, The, Allied Chemical & Dye Corp., New York City.
Bradley & Baker, New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Nitrogen Products, Inc., New York City
Phosphate Mining Co., The, New York City.

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Shuey & Company, Inc., Savannah, Ga.
Stillwell & Gladding, New York City.
Wiley & Company, Baltimore, Md.

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Keim, Samuel D., Philadelphia, Pa.
Phosphate Mining Co., The, New York City.

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Schmaltz, Jos. H., Chicago, Ill.

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Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.

DRYERS
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Chemical Construction Corp., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.
Titlestad, Nicolay, New York City
Stedman's Foundry and Mach. Works, Aurora, Ind.

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American Cyanamid Company, New York City.
Armour Fertilizer Works, Atlanta, Ga.
International Minerals and Chemical Corporation, Chicago, Ill.
Phosphate Mining Co., The, New York City.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

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Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
Huber & Company, New York City.
McIver & Son, Alex. M., Charleston, S. C.

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Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

A Classified Index to Advertisers in "The American Fertilizer"

BUYERS' GUIDE

For an Alphabetical List of all the Advertisers, see page 33

HOPPERS
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.

IRON SULPHATE
Tennessee Corporation, Atlanta, Ga.

INSECTICIDES
American Agricultural Chemical Co., New York City.
McLaughlin Gormley King Co., Minneapolis, Minn.

LIMESTONE
American Agricultural Chemical Co., New York City.
American Limestone Co., Knoxville, Tenn.
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International Minerals & Chemical Corp., Chicago, Ill.
United States Potash Co., New York City.

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Huber & Company, New York City.
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Schmaltz, Jos. H., Chicago, Ill.
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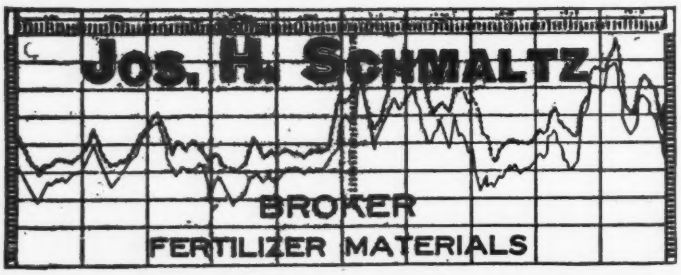

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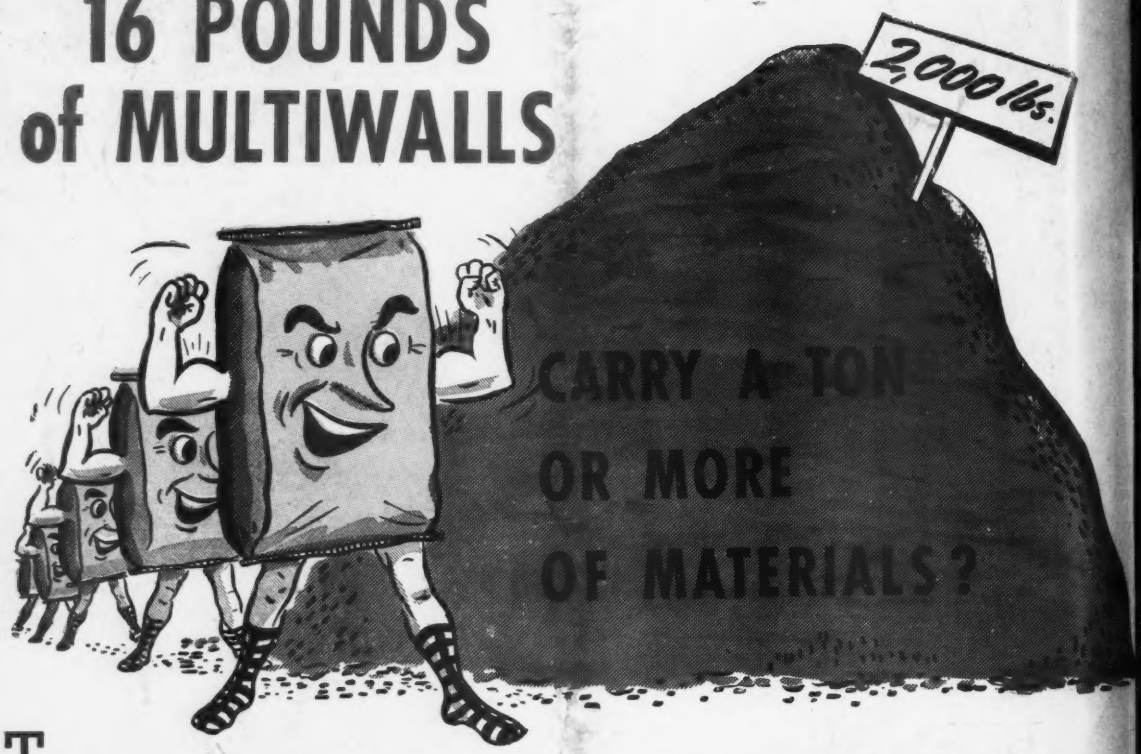

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